2003

Aerial Supervision Module

Operations Guide

PREFACE

Mission Statement

The Aerial Supervision Module is dedicated to supporting ground and aerial firefighters while maintaining safe, efficient, and effective operations.

Concept of Operations

The Aerial Supervision Module (ASM) program was developed based on recommendations for ASM1 operations in the national Tactical Aerial Resource Management to Support Initial Attack and Large Fire Suppression (TARMS) and TARMS Management Options Team (TMOT) report.

The ASM1 is a fixed wing platform that utilizes two crewmembers to perform the functions of traditional air attack and low-level lead operations. The ASM1 requires both crewmembers to be trained to work as a team, utilizing Crew Resource Management (CRM) skills and techniques to enhance safety, efficiency, and effectiveness. Module operations require a fluid relationship between crewmembers that incorporates task sharing and coordination. The ASM1 provides aerial supervision and leadership in support of incident objectives.

Participating Agencies

USDI - Bureau of Land Management (BLM)
Agency Program Manager: National Aviation Office (NAO) - Flight Standards Pilot

State of Alaska, Department of Natural Resources, Division of Forestry (AK-AKS)
Agency Program Manager: State Aviation Manager

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CHAPTER 1 - INTRODUCTION

Objectives

The purpose of this document is to:

- Define and standardize ASM1 roles and responsibilities.

- Define standard procedures for ASM1 operations.

- Define and standardize Air Tactical Pilot ASM1 training requirements.

- Define and standardize Air Tactical Supervisor ASM1 training requirements.

- Facilitate interagency use of ASM1 resources.

Scope

This guide outlines the standards and procedures for ASM1 operations conducted by participating agencies. All agencies conducting ASM1 operations must conform to the standards set in this guide.

Authority

The aviation manuals of participating agencies contain the authority to publish this guide.

CHAPTER 2 - ROLES & RESPONSIBILITIES

Objective

Define roles and responsibilities of each ASM1 crewmember

Introduction

Each crewmember has specific duties and responsibilities that fall within his/her area of expertise. These vary in scope based on the mission and task loads of each crewmember. The Air Tactical Pilot (ATP) is primarily responsible for aircraft coordination over the incident. The Air Tactical Supervisor (ATS) develops strategy in conjunction with the Incident Commander (IC), and when no IC is present assumes those responsibilities until ground personnel arrive.

Air Tactical Pilot (ATP)

The ATP works in a team concept with the ATS by soliciting input and sharing information regarding aerial fire suppression assets, operations, performance, and safety using Crew Resource Management (CRM) skills. Responsibilities are consistent with the traditional role of the Leadplane and include but are not limited to:

- Providing airspace coordination and air traffic management over the incident.

- Surveying the incident and airspace for hazards.

- Providing input to the ATS on overall aviation strategy and tactics to support the mission objectives.

- Establishing communication with aircraft approaching and operating over the incident and insuring compliance with the communication plan.

- Assigning tactical fixed-wing and rotor-wing aircraft to specific tasks based on objectives and aircraft limitations.

- Insuring that the tactical aircraft pilots understand the overall strategy and tactics of the Incident Action Plan.

- Recognizing the changing complexity over an incident and, in coordination with incident personnel, adjusting aerial supervision and resources as necessary.

Air Tactical Supervisor (ATS)

The ATS works in a team concept with the ATP by soliciting input and sharing information regarding aerial fire suppression assets, operations, performance, and safety using CRM skills. Responsibilities are consistent with the traditional role of the ATGS and include but are not limited to:

- Providing airspace coordination and air traffic management over the incident.

- Assuring that appropriate information for the assignment is gathered.

- Evaluating and recommending resource needs for the incident.

- Maintaining communication with incident personnel and dispatch organizations, monitoring ATP aircraft coordination and assignments.

- Developing strategies, applying tactics, and making logistical recommendations in support of incident objectives.

- Recommending Temporary Flight Restrictions (TFR) when appropriate.

- Developing, recommending, and implementing a communication strategy for air-to-air and air-to-ground frequencies.

- Coordinating appropriate action on aircraft incidents and accidents that occur within his/her area of supervision.

- Recognizing the changing complexity over an incident and, in coordination with incident personnel, adjusting aerial supervision and resources as necessary.

CHAPTER 3 - OPERATIONAL PROCEDURES

Objective

Define operational procedures for the Aerial Supervision Module 1

Introduction

ASM1 operations are conducted in a demanding flight environment with periods of high workload. The program utilizes the experience of both crewmembers to create a safe, efficient, and effective method of aerial supervision, which requires strict adherence to standardized flight profiles, terminology, and mission briefings. The ASM1 operations are performed within the parameters defined in this chapter.

The ASM1 was primarily designed for initial attack operations, but can provide incident management teams on large fires with the flexibility of being able to alternate between operational functions until dedicated aerial supervision resources can be assigned to the incident.

The crew has the responsibility to determine when the complexity level of the incident exceeds their capability to perform both functions from one aircraft. The crew requests the additional supervision resources necessary to maintain operational safety and effectiveness.

Incident Strategy and Tactics

Land managers have predetermined strategies for addressing wildfire suppression within their jurisdiction. The Incident Commander communicates the strategy that will be used. In the absence of an Incident Commander, it is the responsibility of the ATS to develop and implement these strategies based on local input and objectives.

Tactical Planning

Tactical planning takes place before every flight, en route, and upon arrival at the incident. Safety of the operation is the first and foremost consideration. Standardized ASM procedures must be followed. Tactical Planning includes the following items:

- Incident objectives
- Coverage levels
- Risk and hazard identification
- Target description
- Ground personnel safety
- Coordination with other incident aircraft
- Formulation of recommendations to support incident strategy and tactics
- Communication planning

Fire Size-Up

The ASM is often the first resource over an incident. It is important to size up the fire, then relay the information to dispatch centers and incident commanders who may not be able to size up the fire from their vantage point or are still en route to the incident. Fire size-up includes the following abbreviated items:

- Incident location
- Estimated size
- Character of fire
- Rate of spread
- Wind direction
- Fuel type
- Terrain
- Values at risk
- Threats to public & firefighter safety
- Fire potential
- Hazard identification
- Recommended resources needed

Low-Level Operations

Low-level flight operations are conducted as required for safety and efficiency. Situational awareness is the responsibility of both crewmembers to ensure safe flight operations. The ASM conducts these operations in the following manner:

ASM Tactical Flight Checklists

The ASM aircraft is configured for tactical flight operations in accordance with the checklist specific to the aircraft being flown. The ASM crew completes tactical checklists before conducting low-level flight.

High-Level Reconnaissance

- Executed prior to descending to low-level.
- Look for aircraft over the incident including media and non-participating aircraft.
- Analyze the terrain. Identify potential approach and departure paths while identifying prominent target features. Fly the patterns at an altitude to detect hazards. Study the lay of the land to establish emergency exits.

Low-Level Reconnaissance

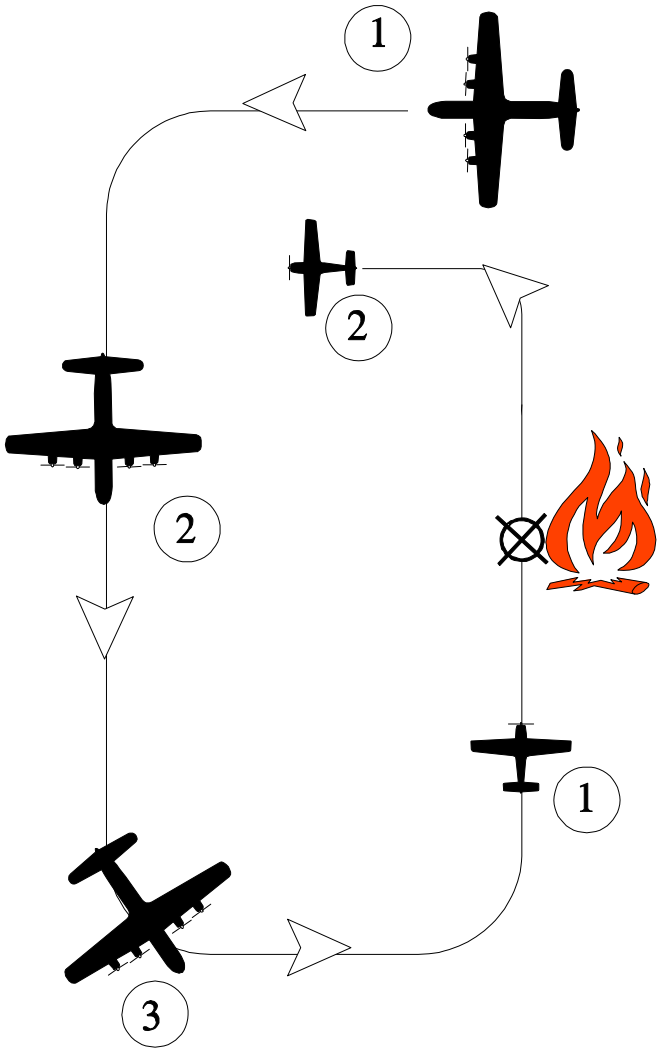
- Check for turbulence, hazards to low-level flight, and low-level target identification features.
- Fly the emergency exit paths to locate potential hazards not identified from a higher level.

Tactical Flight Profiles

Show-Me Profile

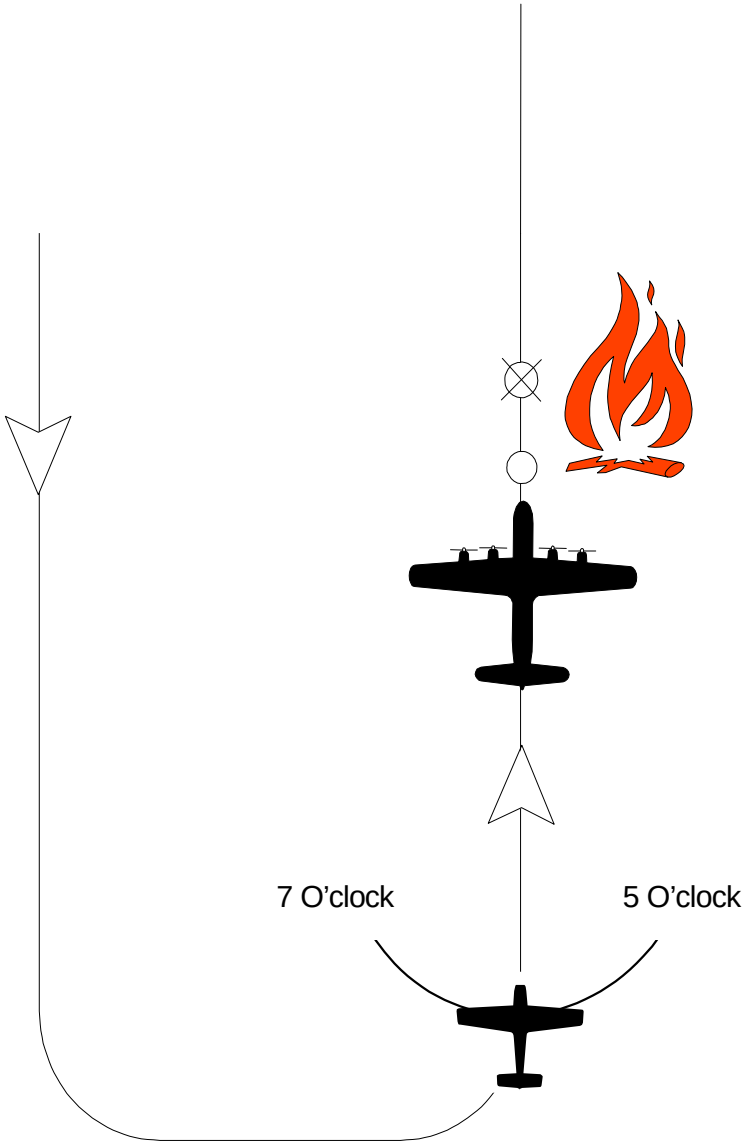
A Show-Me Profile is a low-level pass made over the target using the physical location of the aircraft to demonstrate the line and start point of the retardant drop. The Show-Me Profile is normally used for the first airtanker on a specific run or when an incoming airtanker has not had the opportunity to observe the previous drop. A Show-Me can be used alone or before other profiles.

The pilot begins the run when the airtanker crew can visually identify the aircraft, hazards, line, start and exit point of the drop.



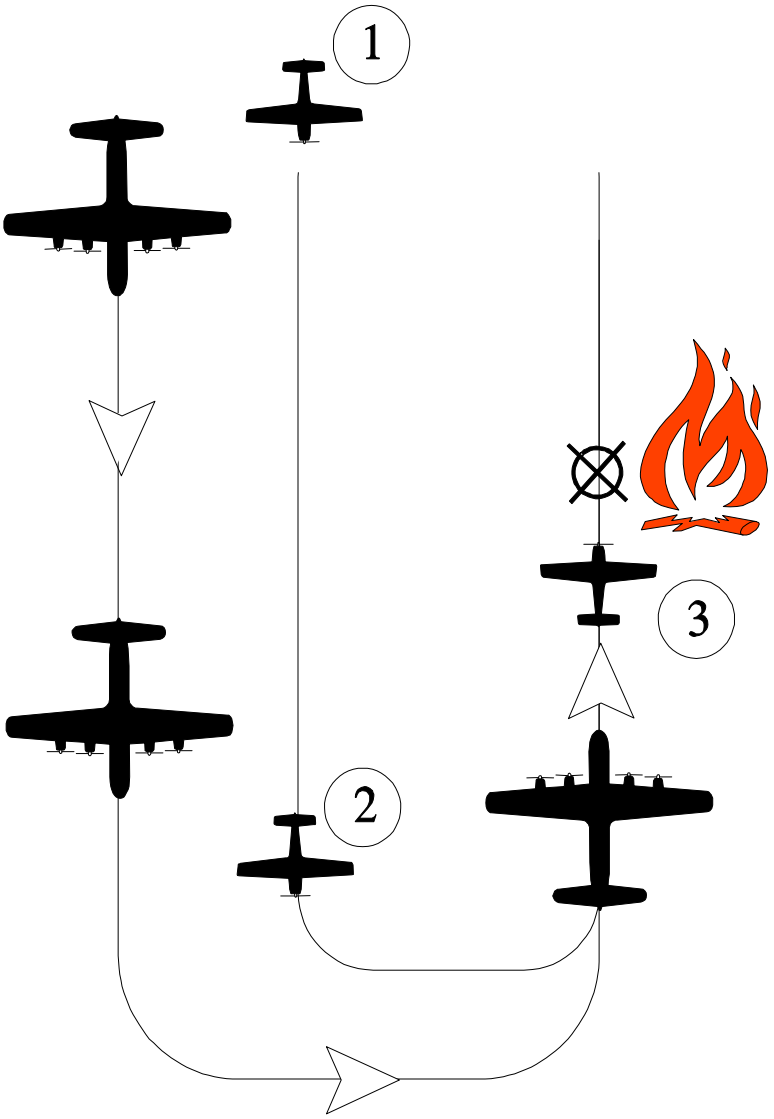
Chase Position Profile

The Chase Position Profile is an observation position in trail of and above the airtanker at a position of 5 to 7 o'clock. The Chase Position Profile is used to verbally confirm or adjust the position of the airtanker when on final, and to evaluate the drop.



Lead Profile

The Lead Profile is a low-level (below 500' AGL) airtanker drop pattern, made with the leadplane approximately 1/4 mile ahead of the airtanker. The Lead Profile is used at the request of the Airtanker Crew, or when the line or start point is difficult to see or to describe due to lack of visibility or references.



On-Scene Briefings

The ATP and ATS will brief airborne and ground resources as follows:

Briefing Type	Air to Air	Air to Ground
Initial	- Initial position & other aircraft * - Altitude & Altimeter setting * - Hazards * - Portion of load & coverage level	- Flight following - Tactical coordination - Confirmation of objectives - Safety concerns
Tactical	- Target description & objectives - Drop heading & altitudes - Hazards - Exits - Drop clearance	- Line clearance - Notification of aerial tactics - Dry run or live run
Post Drop / Departure	- Drop evaluation - Reload instructions	- Drop evaluation request - Additional needs - Flight following

* Required briefing for all aircraft arriving on scene.

MAFFS Operations

MAFFS operations will be conducted in accordance with national program policy.

Resource Status and Identification

ASM1 resource identification and status are reported using the following procedures:

Tactical Aircraft Report

The National Interagency Coordination Center (NICC) and Geographic Area Coordination Centers (GACC) report the status of the ASM1 crews as a National Resource. The ATP's national designator is used (Example: ASM B-4) to identify the operating agency and crewmembers.

Resource Ordering

The mnemonic identifier for ordering an Aerial Supervision Module that is lead capable is ASM1 and can be used to fill the resource orders for both ATGS and Lead Plane. When ordering the individual positions of the ASM1 crew, ATPM is the mnemonic identifier for the Air Tactical Pilot and ATSM for the Air Tactical Supervisor.

Radio Identification

Each agency operating an ASM1 will assign an alphabetical designator. The State of Alaska assigns "A" as their identifier, and the BLM assigns "B." Each pilot operating within that agency uses their assigned national numeric designator. The ASM1 identifies themselves to aircraft, dispatch, and ground forces in the following manner: "Bravo-4". The B or "Bravo" identifier indicates that it is a BLM ASM and is piloted by ATP-4, listed in the National Interagency Mobilization Guide.

Base of Operation

The ASM1 is flexible and can be operated from any Air Attack/Fixed-Wing Base, but it is recommended that the ASM base of operations be at an airtanker base. This allows for pre- and post-briefings with the airtanker crews and base personnel. (See National & GACC Mob Guides.)

Flight and Duty Day Limitations

ATS's attached to an ASM during fire assignments will have the same flight and duty limitation as the ATP. These limitations may be exceeded at the discretion of the ATS during high fire activity if aerial supervision resources are limited and there are threats to public and firefighter safety. Such occurrences must be documented and forwarded to the Agency Program Manager.

Crew Utilization other than ASM Configuration

The ASM1 is a shared National Resource. Any operations that would limit the status of this resource need to be approved by the Agency Program Manager, in concurrence with the flight crew.

Authorized Personnel On Board ASM

The following positions are authorized to be on board the aircraft during ASM1 operations:

- Air Tactical Pilot / Air Tactical Pilot Trainee
- Instructor Pilot / Check Pilot
- Air Tactical Supervisor / Air Tactical Supervisor Trainee
- Other personnel must be authorized in writing by the Agency Program Manager and approved by the flight crew. This is generally limited to three personnel on board the aircraft during low-level fire operations.

CHAPTER 4 - ATP TRAINING & CHECKS

Objective

To define training and qualification standards for the Air Tactical Pilot, Instructor Pilot, and Check Pilot

Documentation of Training

Training Folder

Each pilot is responsible for maintaining an individual training folder. The training folder must include:

- Course completion certificates.
- Copy of the initial training plan.
- Record of ground and flight training including documentation of corrected deficiencies.
- Sign-off documenting completion of each phase of tactical flight training.
- Authorizations and endorsements issued by Agency Program Manager.

Task Book

The pilot's supervisor initiates the task book after the initial review and training recommendations. The Mentor maintains the document to track progress and ensures all the required training has been completed.

Initial Review and Evaluation

When an employee is designated as an ATP trainee, the Supervisor, Mentor, and Agency Program Manager review and evaluate the individual's flying and wildland fire experience. The supervisor initiates the individual's task book, documents the training recommendations, and forwards a copy of the recommendations to the Agency Program Manager. The ATP trainee carries a copy of this document in their training folder, which must accompany the ATP trainee during all phases of training.

Mentor Program

Each ATP trainee is assigned a Mentor by the Agency Program Manager. Mentors are employees with a minimum of two seasons' experience as an ATP/Leadplane Pilot and are responsible for the following:

- Assisting in the development of a training plan for the trainee.
- Tracking the trainee's progress in the task book and ensuring that all training requirements are scheduled in a timely manner.

- Assisting the trainee to solve problems regarding agency requirements and trainee needs.
- Serving as the training evaluator in conjunction with the instructors to ensure that any deficiencies encountered during training are corrected.
- Completing a record review of the candidate's training folder and task book prior to the final evaluation to ensure that all requirements have been met.
- Forwarding the completed training package to the Agency Program Manager for endorsement.
- Scheduling the final Leadplane and ATP check rides.

Air Tactical Pilot Training Syllabus

Training will include the following, unless altered by the Initial Review Panel before training begins.

STAGE	GROUND TRAINING	FLIGHT TRAINING
Pre-requisites	Aircraft Systems/Ground School	- Current agency VFR and IFR check in aircraft to be flown - 5 hours as PIC, make and model, within the last 90 days
Phase 1	Organizational I-200 Basic ICS S-290 Intermediate Fire Behavior S-378 Air Tactical Group Supervisor Operational Airtanker Base Operations Dispatch Operations ASM / CRM Training	- **Minimum** of 10 hours flying, assisting in flight, or observing in flight, actual air tactical fire missions - **Minimum** of 5 hours tactical flight training comprising low-level flight, mountainous terrain flight, tactical proximity flight, and leadplane simulations - Progress and flight review conducted by a current ATP including all activities covered under Phase 1 and a reevaluation of the candidate's training plan, to strengthen any weak areas prior to advancement to Phase 2 - OAS Low-level check ride
Phase 2	Organizational S-270 Basic Aviation Operations S-336 Fire Suppression Tactics National ASM/Leadplane Standardization Recommended Operational Helicopter Operations	- **Minimum** of 10 hours observation of ASM/Leadplane missions during airtanker operations on actual fires (mixed with the mission requirement in this Phase) - **Minimum** of 10 Leadplane missions, as the flying Pilot in the left seat and supervised by an ATP Instructor, on actual fires of varying size and complexity - Flights as observer in a variety of airtankers - Phase Check consisting of an oral examination covering all Phase 2 activities and a flight review on an actual fire. The flight review is conducted by an ATP Check Pilot to identify problem areas.
Phase 3	None	- **Minimum** of 25 total fire missions including Phase 2 as the flying Pilot supervised by an ATP pilot instructor during airtanker operations on actual fires of varying size, complexity, and state/regional locations. - Final progress check and recommendation by an ATP Instructor upon completion of the Phase 3 mission requirement, consisting of an oral review of all aspects of lead operations and assurance that all deficiencies have been corrected and the corrections documented. - Complete records review of the candidate's training folder and task book by the Mentor to determine that all requirements have been met and signed. The Mentor presents the completed package to the NAO or AK-AKS for endorsement and schedules the final Leadplane evaluation with an ATP or Leadplane Check Pilot**.** - Final ATP check ride with ATP Check Pilot after Leadplane signoff and proven performance as Leadplane Pilot has been demonstrated.

Air Tactical Pilot Flow Chart

- Mentor Assigned
- Initial Review & Evaluation
- Task Book Initiated

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Flight Training Prerequisites
- Current Agency VFR/IFR Sign-off - 5 hrs PIC in make & model in the last 90 days

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Phase 1		
Org Training	Ops Training	Flight Training
I-200 S-290 S-378	Airtanker Ops Dispatch Ops ASM/CRM	- 10 hrs min. ATGS Pilot - 5 hrs ASM simulations - Progress Review by ATP Pilot

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Phase 2		
Org Training	Ops Training	Flight Training
S-270 S-336 National ASM/ Leadplane Standardization	(Recommended) Helicopter Ops	- 10 hrs min. observing actual ASM/ Lead missions during airtanker ops - 10 min. missions flying with an ATP Instructor - Observes on various airtankers during drops - Progress check with ATP Check Pilot

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Phase 3
Flight Training
- 25 minimum total fire missions including Phase 2 - Out of Area/Region Experience - ATP Instructor's recommendation & review - Records review by Mentor, forwarded to NAO/AKS - Final Leadplane Check Ride scheduled by the Mentor - Demonstrated performance as Leadplane Pilot

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Final Check Ride by ATP Check Pilot ⇒ -Letter of Authorization Issued by NAO/AKS to perform as ATP ⇒ Post-Authorization Training Plan (Within 2 years)
- MAFFS (if required by Agency)
- Aerial Retardant & Use

ATP Requirements

Mission Currrency Standards

The ATP must perform at least 30 lead missions in a 3-year period. Pilots not meeting this requirement must pass a flight check on an actual ASM mission where a lead is performed, with an ATP Check Pilot.

Annual Recurrent Training and Checks

Currency training provides qualified ATP's with aircraft familiarization, ASM Crew Resource Management (CRM) training, and mission refresher exercises. ASM personnel must attend one full CRM course every three years. Subsequent years require CRM refresher training to include: discussion of the concepts and practices of CRM, teamwork, effective communication practices, aircraft familiarization, and at least one simulation flight. (See Appendix A for required elements)

Ground training includes:

- Target description exercise
- Safety review
- Communications
- Tactics
- Incident command system
- Preseason update
- ASM /CRM

Flight Training includes:

- Fire size-up
- Target description
- ATP tactical flight training
- Communications
- Escape routes
- Emergency procedures
- ASM/CRM simulation flight

All ATPs must pass a competency check annually by an ATP/Leadplane Check Pilot and must attend National ASM/Lead Standardization Recurrent Training every four years.

ASM/CRM Training

Crews that are scheduled to be working together as primaries will attend ASM / CRM training as a team. Completion of ASM/CRM training is required of both crewmembers prior to low-level (ASM1) operations. If both individuals have worked a season as primary ASM crewmembers and previously attended the training, they are exempt from this requirement.

ATP Flight Instructor Requirements

Qualifications

- Current ATP/Leadplane Pilot with a minimum of two seasons' experience after initial qualification
- Multi-Regional and Southern California experience

Nomination Process

The ATP/Leadplane Check Pilot Cadre nominates pilots who meet the qualifications, and who they consider to have the experience, aptitude, dedication, and ability to perform the duties of an ATP Flight Instructor. The ATP/Leadplane Check Pilot Cadre forwards each nominees name to the Agency Program Manager for approval.

Certification

Trainees must pass an ATP Flight Instructor oral exam and a flight check administered by an ATP/Leadplane Check Pilot. (Persons qualified as Leadplane Instructors under the provisions of the ILOG meet the Instructor Pilot qualifications of this section.)

Currency

- Maintain lead currency as outlined in the ILOG/ASM operations guides
- Maintain MAFFS currency (if required by operating agency)
- Biennially pass an ATP/Leadplane Flight Instructor oral review and flight check administered by an ATP/Leadlane Check Pilot

ATP Check Pilot Requirements

Qualifications

- A minimum of five years ATP/Leadplane experience
- A minimum of three years as an active ATP/Leadplane Instructor Pilot
- Possess the appropriate FAA Flight Instructor Certificates

Nomination Process

The ATP/Leadplane Check Pilot Cadre nominates pilots who meet the qualifications and have demonstrated the ability to train and evaluate ATPs in accordance with these requirements. The ATP/Leadplane Check Pilot Cadre forwards each nominee's name to the Agency Program Manager for approval.

Certification

The candidate must pass an ATP Check Pilot standardization ride administered by an ATP/Leadplane Check Pilot. (Persons qualified as Leadplane Check Pilot under the provisions of the ILOG meet the Check Pilot qualifications of this section.)

Training

Attend the biennial ATP/Leadplane Check Pilot Cadre meeting.

Currency

- Maintain ATP/Leadplane currency
- Maintain MAFFS currency (If required by agency)
- Maintain ATP/Leadplane Instructor currency

CHAPTER 5 - ATS TRAINING & CHECKS

Objective

To establish the qualification and training requirements necessary to perform as an Air Tactical Supervisor (ATS) attached to an Aerial Supervision Module (ASM1) that performs low-level flight operations.

Documentation of Training

It is the responsibility of the ATS to maintain and update a training and experience folder to include:

- Course completion certificates
- Completed ATGS task book, or copy of Red Card Qualification
- Documentation of initial flight check issued by a Check ATS
- Annual update of experience to agency specific Incident Qualification and Certification System
- Documentation of annual ASM in-flight recurrent training
- Letter of Authorization signed by the agency ASM Program Manager

The Agency Program Manager maintains copies of the ATS Letter of Authorization and documentation of annual recurrent training.

Initial Training and Evaluation

The supervisor, with assistance from a qualified ASM instructor will oversee the candidate's training, tailors the candidate's curriculum based upon previous training and experience. The minimum fireline qualification for an ATS trainee is Air Tactical Group Supervisor. Upon successful completion of all ATS task and course requirements, an ATS Instructor forwards the recommendation for certification to a Check ATS. The Check ATS reviews the candidate's training documentation, experience, and conducts a flight check on an actual incident to determine that the trainee can safely perform the ASM mission. When the candidate is approved, the Check ATS forwards the nominee's authorization and endorsement to the Agency Program Manager, who issues a Letter of Authorization to the supervisor.

Air Tactical Supervisor Training Syllabus

Initial Training Requirements
· Qualified ATGS - Prior to ATS Trainee Designation · Initial ASM CRM Training * · ATS Task Book Completion · ATS Flight Check * Prior to attending initial ASM CRM training, candidate may perform duties as a trainee with a qualified ATS Instructor.

Currency Requirements
· ASM/CRM Refresher - Annual Qualification · ASM/CRM Training - Every 3 Years · Agency SOP Training - Annually

Post ATS Qualification Recommendations & Target Dates
· Private Pilot Ground School - First Year · Current Fireline Qualification - Every 5 Years

Recommendations

Fireline assignments with local Initial Attack resources should be secured to maintain perspective and enhance credibility with users. ATS fireline qualifications that should be maintained include, but are not limited to:

· Incident Commander - Type 3
· Division Group Supervisor
· Strike Team / Task Force Leader

Recurrent Training

Currency training provides qualified ATSs with aircraft familiarization, ASM Crew Resource Management (CRM) training, and mission refresher exercises. ASM personnel must attend one full CRM course every three years. Subsequent years require CRM refresher training to include: discussion of the concepts and practices of CRM, teamwork, effective communication practices, aircraft familiarization, and at least one simulation flight. (See Appendix A for required elements.)

ASM/CRM Training

Crews that are scheduled to be working together as primaries will attend ASM / CRM training as a team. Completion of ASM/CRM training is required of both crewmembers prior to low-level (ASM1) operations. If both individuals have worked a season as primary ASM crewmembers and previously attended the training, they are exempt from this requirement.

Mission Currency Standards

To maintain currency as an ATS, an individual must complete five ASM missions per year. Failure to maintain these qualifications results in a lapse in currency, and requires a check ride on an actual fire mission utilizing aerial resources by a qualified Check ATS or ATP Check Pilot.

ATS Instructor Requirements

Qualifications

- Current ATS with a minimum of two consecutive seasons' experience after initial qualification or primary ATS attached to an ASM with one full season's experience
- Multi-regional experience

Nomination Process

State ASM program personnel nominate individuals who meet the qualifications and who they consider to have the experience, aptitude, dedication, and ability to perform the duties as an ATS instructor. The ATS Cadre reviews the qualifications and experience of each nominee before recommending their selection to the Agency Program Manager, who adds this designation to the Letter of Authorization.

Currency

- Maintain ATS currency standards outlined in this guide
- Biennially pass an ATS flight check administered by a Check ATS

Check ATS / Cadre Requirements

Qualifications

- Three consecutive years as a fully qualified ATS.
- 1 full season as an ATS Instructor with diverse experience in different regions.
- Current ATS Instructor

Nomination Process

ASM Program Managers, in conjunction with the ATS Cadre, nominate ATS Instructors who meet the requirements and have demonstrated the ability to instruct and evaluate ATSs in the mission environment. Upon their endorsement of the nominee, the ATS Cadre forwards the recommendation to the Agency Program Manager, who adds this designation to the ATSs' Letter of Authorization.

Currency

- Maintain ATS currency standards outlined in this guide
- Maintain ATS Instructor currency
- Attend yearly ATS Cadre meeting

Task Book for The Position of

Air Tactical Pilot

January 2003

Task Book Assigned To:
Individual's Duty Station and Phone Number
Task Book Initiated By:
Official's Title, Duty Station, and Phone Number
Location and Date That Task Book Was Initiated

Verification/Certification of Task Book

Mentor Assigned By Supervisor:

_____

Mentor's Name, Title, and Phone Number

Initial Review Panel: Review Date _____

Individual's Supervisor _____

NAO Representative _____

Assigned Mentor _____

Employee's Signature _____ Date_____

Phase 1 - Progress Review:
Satisfactorily completed all tasks and requirements in this phase and is authorized to proceed to Phase 2.

Air Tactical Pilot's Name _____ Date_____

Phase 2 - Check Ride and Review:
Satisfactorily completed all tasks and requirements in this phase and is authorized to proceed to Phase 3.

ATP Check Pilot's Name_____ Date_____

Phase 3 - Recommendation and Review:
Satisfactorily completed all the tasks and requirements in this phase and is recommended for final progress check.

ATP Instructor's Name_____ Date_____

Records Review:
I have completed a thorough records review of the candidate's training folder and task book and have determined that all the requirements have been met.

Mentor's Signature _____ Date_____

Purpose

The primary purpose of this task book is to provide the Mentor a means to track the Air Tactical Pilot Trainee's progress through the training program in an efficient and thorough manner. Additional objectives are to (1) provide documentation of the initial review and evaluation of the Trainees qualifications and (2) define responsibilities for personnel involved in the training program.

Responsibilities

A. The Supervisor:

- Assigns a qualified Mentor
- Initiates the Trainees task book
- Schedules and organizes the Initial Panel Review
- Assists in the development of the training plan
- Forwards a copy of the initial review recommendations to the ASM Program Manager for approval

B. The Mentor:

- Assists in the development of the training plan
- Tracks the Trainees progress in the task book to ensure all requirements, reviews, and check rides are scheduled in a timely manner
- Assists the trainee in solving problems regarding agency requirements and training needs
- Serves as the training evaluator, working in conjunction with the instructors to ensure that any deficiencies encountered during training are corrected
- Completes a records review of the candidates training folder and task book prior to the final evaluation to ensure that all requirements have been met
- Forwards the completed training package to the NAO/AK-AKS for endorsement, and schedules the final check rides

C. The Trainee:

Maintains his/her individual training folder, which includes:

- Course completion certificates
- Initial training plan copy
- Record of ground and flight training including documentation of corrected deficiencies
- Sign-offs for each phase of tactical flight training
- Authorizations and endorsements from the NAO or AK-AKS

D. Assigned Air Tactical Supervisor

- Provides operational and organizational training assigned by the training plan
- Completes documentation defining the training conducted to be entered into the candidates training folder and provide progressive updates to the mentor and supervisor.

Qualification Record

Position: Air Tactical Pilot

Task	Code *	Evaluator	Completion Date
Prerequisites Current agency VFR and IFR check in aircraft to be flown	O		
5 hours as PIC in make and model within the last 90 days	O		
Ground Training - Phase 1 I-200 Basic ICS	O		
S-290 Intermediate Fire Behavior	O		
S-378 Air Tactical Group Supervisor	O		
ASM / CRM Training	O		
Airtanker Base Operational Training	O		
Dispatch Operational Training	O		
Flight Training - Phase 1 **Minimum** of 10 hours flying, assisting in flight, or observing in flight, actual air tactical fire missions	W		
Minimum of 5 hours tactical flight training comprised of low-level flight, mountainous terrain flight, tactical proximity flight, and ASM simulations	O		
Progress Review - Phase 1 Progress and flight review conducted by a current ATP, including all activities covered under Phase 1; and a reevaluation of the candidates training plan in order to strengthen any weak areas prior to advancement	O		

* Code: O = Task can be completed in any situation (i.e., classroom, simulations, daily job).
W = Task must be performed on a wildfire incident.

Qualification Record

Position: Air Tactical Pilot (continued)

Task	Code *	Evaluator	Completion Date
Ground Training - Phase 2 S-270 Basic Aviation Operations	O		
S-336 Fire Suppression Tactics	O		
National ASM/Lead Plane Standardization	O		
Helicopter Operational Training (Recommended)	O		
Flight Training - Phase 2 **Minimum** of 10 hours observation of ASM/Lead Plane missions during airtanker operations on actual fires (mixed with the following items)	W		
Minimum of 10 Lead missions, as the flying Pilot in the left seat and supervised by an ATP Instructor, on actual fires of varying size and complexity	W		
Flights as observer in a variety of airtankers	W		
Examination and Flight Review - Phase 2 Phase Check consisting of an oral examination covering all Phase 2 activities and a flight review on an actual fire. The flight review is conducted by an ATP Check Pilot to identify problem areas.	W		

* Code: O = Task can be completed in any situation (i.e., classroom, simulations, daily job).
W = Task must be performed on a wildfire incident.

Qualification Record

Position: Air Tactical Pilot (continued)

Task	Code *	Evaluator	Completion Date
<u>Flight Training - Phase 3</u> **Minimum** of 25 total fire missions including Phase 2 as the flying Pilot supervised by an ATP Instructor during airtanker operations on actual fires of varying size, complexity, and state/regional locations	W		
Final progress check and recommendation by an ATP Instructor upon completion of the Phase 3 mission requirement, consisting of an oral review of all aspects of lead operations and assurance that all deficiencies have been corrected and the corrections documented.	W		
Complete records review of the candidate's training folder and task book by the Mentor to determine that all requirements have been met and signed. The Mentor presents the completed package to the NAO/AK-AKS for endorsement and schedules the final evaluation with an ATP Check Pilot.	O		

* Code: O = Task can be completed in any situation (i.e., classroom, simulations, daily job).
W = Task must be performed on a wildfire incident.

Task Book for The Position of

Air Tactical Supervisor

January 2003

Task Book Assigned To:
Individuals Duty Station, and Phone Number
Task Book Initiated By:
Officials Title, Duty Station, and Phone Number
Location and Date That Task Book Was Initiated

Purpose

The primary purpose of this task book is to provide the means to track the Air Tactical Supervisor Trainee's progress through the training program in an efficient and thorough manner. Additional objectives are to (1) provide documentation of the initial review and evaluation of the Trainee's qualifications and (2) define responsibilities for personnel involved in the training program.

Responsibilities

The Supervisor:

- Initiates the Trainee's task book
- Schedules and organizes the initial training review
- Assists in the development of the training plan
- Forwards a copy of the initial review recommendations to the ASM Program Manager for approval

The Assigned ATS Instructor:

- Assists in the development of the training plan
- Tracks the Trainee's progress to ensure all requirements and training are scheduled in a timely manner
- Assists the trainee in solving problems regarding agency requirements and training needs
- Serves as the training evaluator, working in conjunction with the instructors to ensure that any deficiencies encountered during training are corrected
- Schedules the flight check with a Check ATS

The Trainee:

Maintains his/her individual training folder, which includes:

- Course completion certificates
- Initial training plan copy
- Record of ground and flight training including documentation of corrected deficiencies
- Authorizations and endorsements from the NAO or AK-AKS

Qualification Record

Position: Air Tactical Supervisor

Task	Code *	Evaluator	Completion Date
Prerequisites Qualified ATGS - Prior to ATS Trainee Designation	W		
Ground Training Initial ASM / CRM Training	O		
Aircraft familiarization -Normal & Emergency Procedures -Communication Systems -Navigation Systems -Passenger Briefings	O		
Flight Training -Phase 1 **Minimum** of 1 familiarization flight detailing: -Checklist procedures -Crew Resource Management -Communications & Navigation Systems	O		
Minimum of 2 simulated fire missions, including low-level flight profiles	O		
Minimum of 2 actual fire missions observing a fully qualified ASM crew	W		
Flight Training - Phase 2 Tactical flight training on actual fire missions as an ATS Trainee with an ATS Instructor. The areas being trained and evaluated are:	W		
- Ability to coordinate rotor-wing resources in conjunction with fixed-wing airtankers	W		
- Maintaining situational awareness during all phases of the mission	W		
- Communication skills with ATP, dispatch, and ground personnel	W		
- Coordination with the ATP to maintain a safe and effective aerial operation	W		

* Code: O = Task can be completed in any situation (i.e., classroom, simulations, daily job).
W= Task must be performed on a wildfire incident.

Qualification Record

Position: Air Tactical Supervisor

Task	Code *	Evaluator	Completion Date
-Exercises proper CRM practices and works as a team with the ATP and incident personnel	W		
-Ability to recognize and evaluate mission complexity and how it relates to ASM operations	W		
Examination and Flight Review -Completion of training and recommendation for flight review from an ATS Instructor	O		
-Flight review conducted by a Check ATS on an actual ASM fire mission (attach completed initial check-ride form signed by Check ATS.)	W		

* Code: O = Task can be completed in any situation (i.e., classroom, simulations, daily job).
W = Task must be performed on a wildfire incident.

APPENDIX A

ASM CRM TRAINING

GOALS OF TRAINING

To enhance aviation safety and performance by improving our ability to make decisions and manage multiple tasks, while providing for an efficient and successful mission, through additional knowledge and training.

REQUIRED ELEMENTS OF CRM TRAINING

There are four categories of CRM training: Human, Aircraft (hardware), Firefighting, and Communications. These categories have common characteristics, or elements, which may overlap:

HUMAN
- Attitude
- Decision Making
- Problem Solving
- Teambuilding
- Fatigue and Stress
- Leadership
- Task Management
- Situational Awareness

FIREFIGHTING
- Recurrent Training
- Retardant Use
- New Policies

AIRCRAFT
- New Technology
- Mountain Flying
- Formation Flying
- Simulator

COMMUNICATION
- Radio Discipline
- Common Terminology
- Avionics
- Crew Member Interaction
- Dispatch
- Ground Resources
- Air Resources

ASM CRM training will consist of at least one element from each of the four categories. Elements may be in close relationship with each other, such as Formation Flying, which would naturally also include elements of Situational Awareness and Communication with Air Resources. Such an exercise would cover the three categories of Human, Aircraft, and Communication.

Standard three to five day ASM CRM training shall consist of both classroom exercises and actual flight mission simulations.

GLOSSARY

The terms included in this glossary are terms used in ICS wild land-urban interface fire and aviation operations. Familiarization and use of these terms will standardize communication, and will result in more efficient fire and aviation operations.

"A" ALPHA	Mnemonic identifier for AK-AKS aircraft.
ABEAM	An aircraft is abeam a fix, point, or object when the fix/point/object is approximately 90 degrees left or right of the aircraft's track.
ABORT	To terminate a planned aircraft maneuver.
AGL	Above ground level.
AIR TAC	ICS identifier for the Air Tactical Group Supervisor
AIRTANKER COORDINATOR	Airborne position supervised by the Air Tactical Group Supervisor. Assigns airtankers to specific targets. Supervises and evaluates drops. The position is normally filled with a Leadplane Pilot.
ANCHOR POINT	A strategic and safe point or area, usually a barrier to fire spread, form which to start construction of the control line.
ASM1	An Aerial Supervision Module platform with an Air Tactical Pilot and Air Tactical Supervisor on board. This module can perform aerial supervision and low-level operations including the lead profile.
ASM2	An Aerial Supervision Module platform with an Air Tactical Pilot and Air Tactical Supervisor on board. This module can perform aerial supervision and low-level operations, but is <u>not</u> lead profile authorized.
ASSIGNED TO	Tactical resource allocated to an incident. The resource may be flying en route to and from, or on hold at a ground site.
ATP	Air Tactical Pilot. A National designated pilot of an ASM who is primarily responsible for aircraft safety and providing aircraft coordination over the incident. The ATP meets the Interagency Lead plane Operations Guide requirements for lead plane operations and has completed ASM/CRM training.

ATP CHECK PILOT	An ATP designated by the BLM or AK-AKS to evaluate ATP trainees for initial certification and ATPs for recertification.
ATP INSTRUCTOR	An ATP designated by the BLM of AK-AKS to mission train ATP trainees.
ATS	Air Tactical Supervisor. A qualified Air Tactical Group Supervisor per NWCG 310-1, has completed ASM/CRM training, and has demonstrated the ability to perform in the Aerial Supervision Module environment, including low-level operations.
"B" BRAVO	Mnemonic identifier for BLM aircraft.
BACKFIRE	Fire set between the control line and the main fire to consume unburned materials to stop the advance of the main fire. A backfire is only used when the main fire is burning actively enough to suck the backfire against the wind.
BARRIER	Any obstruction to the spread of the fire. Typically an area or strip devoid of flammable fuel.
BLOWUP	Sudden increase in fire intensity or rate of spread sufficient to preclude direct control.
BASE (OF A FIRE)	The part of the fire perimeter opposite the head (also see origin). Also referred to as rear or heel.
BASE (FLIGHT PATTERN)	See Flight Pattern.
BREAK LEFT OR RIGHT	Turn left or right. Applies to aircraft in flight, usually on the drop run and when given as a command to the pilot. Implies immediate compliance.
BURN OUT	Fire set at the inside edge of a control line to consume unburned materials between the fire and the control line. Usually associated with indirect attack.
CANOPY	The stratum containing the crowns of the tallest vegetation present (living or dead), usually above 20 feet.
CARDINAL POINTS	The four chief points of the compass: North, South, East, and West.
CLOCK METHOD	A means of establishing a target or point by reference to clock directions where the nose of the aircraft is 12 o' clock, moving clockwise to the right wing at 3 o'clock, the tail at 6 o'clock, and the left wing at 9 o'clock.

CONFIGURATION	How the aircraft is equipped, outfitted, modified for a mission or segment of a mission. Also refers to use of drag devices (flaps, gear) to modify flight characteristics.
CONGESTED AREA	FAA (non-specific) term for areas that require additional precautions and procedures to conduct low-level flight operations. The FAA on a case-by-case basis applies it. The regulation addresses, "any congested area of a city, town, or settlement, or over any open air assembly of persons...."
CONSTANT FLOW TANK SYSTEM	A single compartment with two doors controlled by a computer intervalometer. Capable of single or multiple even flow drops at designated coverage levels from .5 GPC to 8 GPC.
CONTROL LINE	An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire's spread.
COVER ASSIGNMENT	Air tankers ordered to a different base to provide initial attack coverage at the new base. Sometimes referred to as "Move Up and Cover."
COVERAGE LEVEL	A numerical value representing the number of gallons of retardant mixture dropped, or prescribed, to cover fuels in a 100 sq. ft. area (GPC).
CUT OFF TIME	Time when operations involving low-level flight maneuvers must be suspended.
DELAYED ATTACK FIRE	A fire, which due to its lower priority and/or unavailability of ground resources will not be staffed for several hours or possibly several days.
DIRECT ATTACK	Control effort (retardant line, fire line) conducted at fire perimeter (fire edge) - usually under low fire intensity conditions.
DIVERT	Change in aircraft assignment from one target to another or to a new incident.
DRIFT CORRECTION	Offset flight path flown to compensate for wind induced retardant drift.
DRIFT SMOKE	Smoke that has drifted from its point of origin and has lost any original billow form.
DROP	Aerial release of Para cargo, retardant, or water/foam.

DROP CONFIGURATION	The type of drop the air tanker/helitanker pilot selects to achieve the desired coverage level based on the aircraft's door/tanksystem.
DROP ZONE	The area around the target to be dropped on.
DRY RUN	A low pass over the target without dropping to evaluate drop conditions and/or alert ground personnel of an impending live run.
EARLY	Indicating drop was early or short of the target.
ENGINE	(In fire context) a ground vehicle crewed by firefighters that dispense water or foam normally with fire hoses and nozzles.
ESCAPE ROUTE	The safest, quickest or most direct route between a firefighter's location and a safety zone.
EXIT	Term used to indicate the flight route away from the drop area.
EXTEND	Drop retardant so that the load overlaps and lengthens a previous drop.
FALSE ALARM	A reported smoke or fire requiring no suppression action.
FINGER	A narrow elongated portion of a fire projecting from the main body.
FIRE BREAK	A natural or constructed barrier used to stop or check fires or to provide a control line from which to work.
FIRE LINE	A control line that is void of burnable material. Fire lines are normally constructed by hand crews.
FIRE PERIMETER	The active burning edge of a fire or its exterior burned limits.
FIRE SHELTER	An aluminized, heat reflective, firefighter's personal protective pup tent used in fire entrapment situations. The heat reflection capability of the exterior is the primary function of the shelter. DO NOT drop fire retardants on the tent as it will compromise the heat reflection capability of the shelter.
FIXED TANK	A tank mounted inside or directly underneath an aircraft, which contains water or retardant for dropping on a fire.

FIXED WING COORDINATOR	A non-fire airborne position designed to supervise airplanes on incidents.
FLANKING ATTACK	An attack made along the flanks of a fire either simultaneously or successively from the less active flank or anchor point and endeavoring to connect the two lines to the head.
FLANKS	The parts of a fire perimeter that are roughly parallel to the main direction of spread. The left flank is the left side as viewed from the base of the fire, looking toward the head.
FLIR	Forward Looking Infrared.
FLIR/ATGS	ATGS aircraft equipped with FLIR. FLIR used in ATGS operations.
FUEL BREAK	A wide strip or block of land on which the vegetation has been permanently modified to a low volume fuel type so that fires burning into it can be more readily controlled.
FUGITIVE RETARDANT	A clear retardant, without iron oxide (red color agent), or a retardant with a red color agent that fades or becomes invisible after exposure to ultraviolet sunrays.
GO AROUND	Abort the retardant run.
GPC	A term relating to retardant coverage levels meaning Gallons per 100 Sq. Ft.
HEAD	The most rapidly spreading portion of a fire perimeter, normally located on the leeward or up slope side.
HELCO (HLCO)	Call sign identifier of the Helicopter Coordinator.
HERE	Term communicated by the lead plane pilot to the air tanker or helitanker pilot identifying the target location and starting point of a drop.
HELITANKER	Helicopters configured with fixed tanks or a bucket for dropping water, foam, or retardant.
HOLD (Holding Area)	A predetermined flight pattern, which keeps aircraft within a specified airspace while awaiting further clearance.
HOLDING ACTION	Use of an aerial application to reduce fire intensity and fire spread until ground resources arrive. Common with delayed attack fires.

HOSE LAY	Arrangement of connected lengths of fire hose and accessories beginning at the first pumping unit and ending at the point of water delivery.
HOTSHOT CREW	A highly trained firefighting crew used primarily in hand line construction.
HOTSPOT	Particularly active part of a fire.
INDIRECT ATTACK	Control line located along natural or human made firebreaks, favorable breaks in topography or at a considerable distance from the fire perimeter.
INTERVALOMETER	A cockpit mounted electronic device/selector box which actuates the compartment door(s) singly, or multiple doors simultaneously or in sequence, at preset time intervals. Pilot or co-pilot selects number of doors and time interval between doors to produce the desired coverage level and line length.
ISLAND	Green or unburned area within the fire perimeter.
KNOCK DOWN	To reduce flame or heat in a specified target. Indicates the retardant load should fall directly on the burning perimeter or object. Used to assist ground forces.
LATE	Indicating the drop was late or overshot the target.
LEADPLANE	An airplane crewed by a qualified lead plane pilot tasked to lead air tankers in low-level drop runs.
LEADPLANE CHECK PILOT	A lead plane pilot designated by the USDA-FS or USDI-BLM to evaluate lead plane pilot trainees for initial certification and lead plane pilots for recertification.
LEADPLANE PILOT	Performs Air tanker Coordinator duties and makes low level pass through the drop area to assess flight conditions, hazards, and to identify the target.
LEADPLANE PILOT INSTRUCTOR	A leadplane pilot designated by the USDA-FS or USDI-BLM to mission train leadplane pilot trainees.
LIVE RUN	A flight over the drop area in which a discharge of cargo or retardant/water etc., will be made.
LOAD AND HOLD	The air tanker is being ordered to reload and hold at the retardant base awaiting further instructions. **Note**: Air tankers on Load and Hold can be reassigned to higher priority incidents.

LOAD AND RETURN	The air tanker is being ordered to reload and return to the fire with the load of retardant.
LOW PASS	Low altitude run over the target area used by the lead plane pilot and/or air tanker pilots to identify the target and assess flight conditions on the approach and exit.
MAFFS	Modular Airborne Firefighting Systems - Military aircraft equipped to drop retardant. Used in emergencies to supplement commercial air tankers.
MAIN RIDGE	Prominent ridgeline separating river or creek drainage. Usually has numerous smaller ridges (spur ridges) extending outward from both sides. Can be confusing if not covered in orientation.
MAYDAY	International distress signal/call. When repeated three times it indicates imminent and grave danger and that immediate assistance is required.
MENTOR	A pilot with a minimum of two years experience as a qualified lead plane pilot assigned to assist a trainee lead plane pilot to successfully complete training.
MISSION (LEADPLANE)	A lead plane mission consists of a flight on an actual fire where retardant is dropped. Each additional fire flown during a single flight counts as an additional mission.
MOAA	Military Operations Area (Special Use Area) identified on aeronautical sectional charts.
MSL	Mean Sea Level.
MTR	A Military Training Route found on aeronautical sectional map and AP/1B maps. Routes accommodate low-altitude training operations - below 10,000 MSL - in excess of 250 KIAS.
ON TARGET	Acknowledgment to pilot that the drop was well placed.
ORBIT	See HOLD.
ORIGIN	Point on the ground where the fire first started (also see BASE).
OVERTAKE	Unintentional passing of the aircraft in the lead by the trailing aircraft.

PARALLEL ATTACK	A control effort generally parallel to the fire perimeter, usually several feet to +100 ft. away. Allows line construction before the fires lateral spread outflanks line construction operations.
PERIMETER	The outside edge of the fire.
POCKETS	Areas of unburned fuel along the fire perimeter.
PORTION OF LOAD	Portion of the air tanker retardant to be dropped. Portions are identified by fractions of the load (1/4, 1/3, ½, whole load or given start/stop points on the ground.
PRE-TREAT	Laying retardant line in advance of the fire where ground cover or terrain is best for fire control action, or to reinforce a control line, often used in indirect attack.
REBURN	Subsequent burning of an area in which fire has previously burned but has left flammable fuel that ignites when burning conditions are more favorable.
RETARDANT	
LONG TERM	Contains a chemical that alters the combustion process and causes cooling, smothering, or insulating of fuels. Remains effective until diluted or rinsed off.
SHORT TERM	Chemical mixture whose effectiveness relies mostly on its ability to retain moisture, thereby cooling the fire. Common short-term retardants are water and foam.
ROTOR SPAN	The length of a rotor diameter. Used to make adjustments in alignment of flight route when dropping water/retardant.
ROUTE (Flight)	The path an aircraft takes from the point of departure to the destination.
RUNNING	Behavior of a fire, or portion of a fire, spreading rapidly with a well-defined head.
SADDLE	Depression or pass in a ridgeline.
SAFETY ZONE	An area used for escape in the event the fire line is overrun or outflanked, or in case a spot fire causes fuels outside the control line to render the fire line unsafe. During an emergency, air tankers may be asked to create a safety zone using retardant drops.

SCRATCH LINE	A preliminary control line hastily built with hand tools as an emergency measure to check the spread of a fire.
SECONDARY LINE	A fire line built some distance away from the primary control line, used as a backup against slopovers and spot fires.
SLASH	Debris left after logging, pruning, thinning or brush cutting.
SLOPOVER	The extension of a fire across a control line.
SMOLDERING	Behavior of a fire burning without flame and slowly spreading.
SNAG	A standing, dead (defoliated) tree.
SPECIAL USE (DOI)	Flight operations requiring special pilot skills/experience and aircraft equipment to perform the mission.
SPOT FIRE	A fire start caused by the transfer of burning material through the air into flammable material beyond the perimeter of the main fire.
SPOTTING	Behavior of a fire producing sparks or embers that are carried by the wind and start new fires outside the perimeter of the main fire.
SPUR RIDGE	A small ridge, which extends finger-like from a main ridge.
SUA	Special Use Airspace including Military Operations Areas (MOA's), Restricted Areas, Prohibited Areas, Alert Areas, Warning Areas, and Controlled Firing Areas.
SUPPRESSANT	A water or chemical solution, which is applied directly to burning, fuels. Intended to extinguish rather than retard.
SURFACE FIRE	Fire that burns surface litter, other loose debris of the forest floor, and small vegetation.
TARGET	The area or object you want a retardant /water drop to cover.
TARMS	National Study of Tactical Aerial Resource Management to Support Initial Attack and Large Fire Suppression. Completed in 1998 by a committee made up of federal and state agency membership from all geographic areas throughout the United States.
TCAS	Traffic Collision Avoidance System, electronic aid that gives the azimuth, distance, and relative altitude of transponder-equipped aircraft in relation to the TCAS equipped aircraft.

TFR	Temporary Flight Restriction (91.137). Airspace within which certain flight restrictions apply.
TIE-IN	To connect a retardant drop with a specified point (road or previous drop, etc.).
TMOT	TARMS Management Options Team Report. An interagency team chartered to review, examine and validate TARMS. Proposed recommendations were completed in February 2000.
TRAFFIC PATTERNS	The recommended flight path for aircraft arriving at and departing from an airport.
BASE	A flight path at right angles to the landing runway or target off its approach end.
CROSSWIND	A flight path at the right angles to the landing runway or target off its upwind end.
DOWNWIND	A flight path parallel to the landing runway or target in a direction opposite to landing or drop direction.
FINAL	A flight path in the direction of, and prior to, the landing or drop area.
UPWIND	A flight path parallel to the direction of the final before turning crosswind.
UHF	Ultra High Frequency. Common to military aircraft. Incompatible with VHF radio system. Operates in 300-3000 Mhz range.
VHF	Very high frequency radio. The standard aircraft radio that all civil and most military aircraft use to communicate with FAA facilities and other aircraft.
VHF-AM	Amplitude modulation radio. Aircraft radio, range 118 Mhz to 130 Mhz. Used on wild land fire incidents for ground-to-air and air-to-air communication.
VHF-FM	Frequency modulation radio. Multi-agency radio commonly used for dispatch, land-based mobile and airborne communications. Operates in range of 150 Mhz to 175 Mhz.
VARIABLE FLOW TANK SYSTEM	Multiple tanks or compartments controlled by an electronic intervalometer control mechanism to open doors singly, simultaneously, or multiple doors in an interval sequence.

VICTOR	Another way of referring to VHF-AM.
WATERWAY	Any body of water including lakes, rivers, streams, and ponds whether or not they contain aquatic life.
WINGSPAN	The length of the air tanker's wing span from tip to tip. Used to make low level ground track adjustments. **Note**: Adjustments less than half a wingspan are given in feet.